Column 445

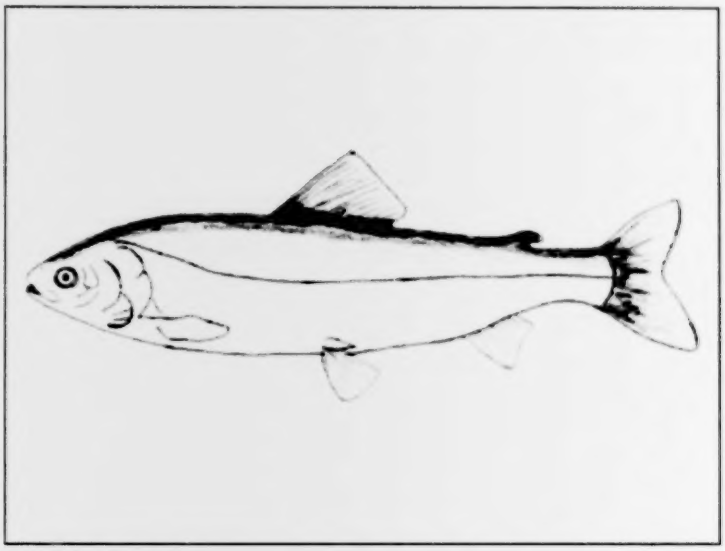
Unsung Bering cisco deserve more respect

by Erling Friis-Baastad

We all admire the life saga of salmon, their bold journeys thousands of kilometres upriver from the sea, as they make their way past bears, fish wheels and nets, through rapids and fish ladders and into little creeks to spawn.

But in September and October, the celebrity salmon's less-revered cousin, the mighty little Bering cisco, also makes its way up the Yukon and Kuskokwim rivers.

What this half-metre-long relative of whitefish and inconnu lacks in size, it more than makes up for in numbers, far outnumbering any other fish species spawning in the river, says Whitehorse fisheries biologist Nick de Graf, owner-operator of Can-nic-a-nick Environmental Sciences.



Each autumn huge numbers of Bering cisco migrate up the Yukon River from the coast, some as far as Dawson City.
(drawing: Nancy Lewis-de Graf)

Fish wheels along the Yukon will "catch, say, 200 cisco a day... where with chum they'd catch only a half dozen or so," says de Graf. To really appreciate that, we must remember that those fish wheels are positioned to catch salmon, not cisco.

The small traveler is also far more of a mystery fish, he adds. Much about this species -- its biology, natural history, spawning areas -- is unknown because, compared to salmon, there's not much of a fishery for it, he says.

Public funds aren't generally funneled into research on fish with limited commercial appeal. Yukon scientists don't tag cisco.

"But to the ecology of coastal regions, the brackish lagoons of the Alaska coast, they are a cornerstone species; they contribute to a lot of other fish species that eat them,

as well as mammals," he says. 2008-02845/

"Aboriginal cultures always understood that everything is always tied to everything else on the planet, to all life forms, as well as the inanimate," he adds.

Now science overall is moving toward that holistic way of thinking, "but very slowly and the information that we have is very, very small compared to the complexity of the world," he says.

There are plenty of other species of cisco around. The least cisco, a smaller relative, is especially common and found in fresh water over much of Canada. De Graf first encountered them in Manitoba, where he began his scientific career.

Least cisco are also found in the Yukon in the bigger lakes: Tagish Lake, Lake Laberge and Teslin Lake.

Arctic cisco, which run in the Mackenzie River, "have a almost identical life history traits" as the Bering cisco. The two species can be difficult to tell apart and their ranges overlap along the Beaufort Sea and the north coast at Prudhoe Bay.

De Graf refers to Bering cisco as "a Beringian fish," because its range is limited to eastern Russia, Alaska and the Yukon.

He has spoken to elders in the Dawson City area about cisco. They have a word in the Han language for herring-like fish, and do call the Bering cisco herring, but don't really distinguish among cisco species.

In Dawson the Bering cisco is at the furthest-east edge of its migratory route, though de Graf tends to qualify further statements about the fish's life patterns with warnings about the limits of our knowledge.

The Bering cisco leave the coastal brackish waters, where they have been feeding on plankton, shrimp and tiny invertebrates, and head up the major river stem in the fall.

Some travel to an area just downstream from Dawson City, and apparently spawn in the main stem of the river, not in small tributaries as salmon do.

And they don't travel quite as far as many salmon, not making it as far as Whitehorse, for instance. But it's still impressive to think of the little fish battling 2,100 kilometres upriver against currents of five to ten kilometres an hour.

The ciscos don't eat over the entire trip. "They've cut open quite a few of them and their stomachs have been empty," says de Graf.

"Some people suggest that they may over-winter (upriver) after doing their migration, stay there and then go out the following spring when the water levels go up."

Apparently the Bering cisco does not die after spawning, but whether individuals spawn repeatedly is anyone's guess so far.

And just how long they stay upriver, and where exactly they spawn is something of a mystery.

Strontium analysis of the otolith -- the "ear bone" -- in Bering cisco has proven they are anadromous, that they spend much of their lives in salt water, which contains more strontium than fresh water does. The otolith is the equivalent of a fish's ear, aids with balance, and builds calcium rings, or annuli, which can be interpreted much like tree rings.

Following the hatch in fresh water, likely within a year, the little cisco drift downriver to the coastal areas near the estuaries of the Yukon and Kuskokwim rivers. "There is a massive exodus at some point," says de Graf.

Their mouths and gill-rakers are designed for filtering plankton. On the coast they drift feed in the nutrient-rich brackish waters until they are sexually mature, somewhere from four to nine years.

When compared to how long it takes it takes a lake trout or a sturgeon to mature, this is a very short time, he adds.

Unlike salmon, who tend to be more careful of where the lay eggs, the Bering cisco also broadcast millions of eggs during their spawn "and hope for the best," he says.

The best is actually relatively good. Longer-lived species, like lake trout, are very difficult to manage, and their stocks are rapidly being depleted. The Bering cisco's future looks brighter... but not totally secure.

Artificial structures built across migration routes are a major issue. On the coast these include industrial causeways that can extend far off the coast. Oil spills, sewage discharges, radioactive waste can also threaten this cornerstone species.

"It's important to protect them as you would the salmon that spawn up Michie Creek," says de Graf.